

What is claimed is:

1. A noise filter comprising:

a ground line for discharging a short-circuit current generated on an electronic apparatus to ground;

an inductor which suppresses a noise current, induced  
5 on the ground line, flowing from the ground line into the electronic apparatus; and

a resistor connected in parallel with the inductor;  
wherein

assuming a lower limit angular frequency of the noise  
10 current to be  $\omega_n$ [rad], inductance of the inductor to be  $L$ [H], resistance of the resistor to be  $R[\Omega]$ , and earth capacitance of the electronic apparatus is  $C$ [F], a relationship of  $\sqrt{L/C} < R < 2\omega_n^2 L$  (provided  $C > 1/(4\omega_n^4 L)$ ) is established.

2. A noise filter comprising:

a ground line for discharging a short-circuit current generated on an electronic apparatus to ground;

an inductor which suppresses a noise current, induced  
5 on the ground line, flowing from the ground line into the electronic apparatus; and

a resistor connected in parallel with the inductor;  
wherein

the inductor has a magnetic saturation characteristic,  
10 by which the inductor acts as a circuit element magnetically saturated by the short-circuit current and discharges the

short-circuit current from the electronic apparatus to the ground line.

3. The noise filter as claimed in claim 2, wherein the resistor suppresses a resonant frequency current caused by series resonance of, earth capacitance between the electronic apparatus and ground, and the inductor, and dissipates  
5 electric power charged in the inductor.

4. The noise filter as claimed in claim 2, wherein assuming a lower limit angular frequency of the noise current to be  $\omega_n$ [rad], inductance of the inductor to be  $L$ [H], resistance of the resistor to be  $R[\Omega]$ , and earth capacitance  
5 of the electronic apparatus is  $C$ [F], a relationship of  $\sqrt{L/C} < R < 2\omega_n^2 L$  (provided  $C > 1/(4\omega_n^4 L)$ ) is established.

5. The noise filter as claimed in claim 2, wherein assuming an angular frequency of a power supply current to be  $\omega_p$ [rad], a lower limit angular frequency of the noise current to be  $\omega_n$ [rad], inductance of the inductor to be  $L$ [H], and  
5 resistance of the resistor to be  $R[\Omega]$ , a relationship of  $10(\omega_p \cdot L) < R < (\omega_n \cdot L)/10$  is established.

6. The noise filter as claimed in claim 2, wherein assuming an angular frequency of a power supply current to be  $\omega_p$ [rad], a lower limit angular frequency of the noise current

to be  $\omega_n[\text{rad}]$ , inductance of the inductor to be  $L[\text{H}]$ , and  
5 resistance of the resistor to be  $R[\Omega]$ , a relationship of  
 $100(\omega_p \cdot L) < R < (\omega_n \cdot L)/100$  is established.

7. The noise filter as claimed in claim 2, wherein  
assuming an angular frequency of a power supply current to be  
 $\omega_p[\text{rad}]$ , a lower limit angular frequency of the noise current  
to be  $\omega_n[\text{rad}]$ , inductance of the inductor to be  $L[\text{H}]$ , and  
5 resistance of the resistor to be  $R[\Omega]$ , a relationship of  
 $1000(\omega_p \cdot L) < R < (\omega_n \cdot L)/1000$  is established.

8. The noise filter as claimed in claim 2, wherein a  
parallel circuit consisting of the inductor and the resistor  
is so formed that one terminal is grounded through the ground  
line and another terminal connects to the electronic  
5 apparatus.

9. The noise filter as claimed in claim 2, wherein when  
the short-circuit current is  $25[\text{A}]$ , impedance of the noise  
filter is  $0.1[\Omega]$  or less.

10. The noise filter as claimed in claim 2, wherein when  
a frequency of the noise current is  $10[\text{kHz}]$ , reactance of the  
inductor is  $2[\text{k}\Omega]$  or more.

11. The noise filter as claimed in claim 2, wherein the  
resistor is a variable resistor.

12. The noise filter as claimed in claim 11, wherein the inductor is a toroidal coil, a parallel circuit consisting of the toroidal coil and the variable resistor is housed in a frame, the variable resistor is arranged in a space  
5 surrounded by an inner peripheral wall of the toroidal coil, and resistance varying means for varying resistance of the variable resistor is provided at such a position as to be able to be operated from an outside of the frame.

13. An electronic apparatus comprising the noise filter as claimed in any one of claims 1 to 12.